

FLIGHT SUMMARY REPORT

Flight Number: 97-007-04
Calendar/Julian Date: 02 July 1997 • 183
Sensor Package: Thermal Infrared Multispectral
Scanner (TIMS)
DoE Multispectral Scanner (MSS)
Area(s) Covered: Oklahoma

Investigator(s): Schmugge, USDA

Aircraft #: 799
Department of Energy
Cessna Citation

SENSOR DATA

Accession #:	----	----
Sensor ID #:	086	1268
Sensor Type:	TIMS	MSS
Focal Length:	----	----
Film Type:	----	----
Filtration:	----	----
Spectral Band:	----	----
f Stop:	----	----
Shutter Speed:	----	----
# of Frames:	----	----
% Overlap:	----	----
Quality:	Good	Good
Remarks:		

Airborne Science and Applications Program

The Airborne Science Branch at NASA's Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and in situ data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor(s) and camera(s) used for data collection during this flight.

Department of Energy Remote Sensing Laboratory

The NASA Airborne Science and Applications Program at Ames Research Center contracted with the Department of Energy Remote Sensing Laboratory (RSL) in Las Vegas, Nevada to fly the RSL Multispectral Scanner (MSS) and the NASA Thermal Infrared Multispectral Scanner (TIMS) over the desert southwest. The scanners were flown on the DOE Cessna Citation.

The Cessna Citation is a low and medium altitude, moderate speed aircraft. It can operate from 4,000 to 35,000 feet above sea level at speeds between 135 and 225 knots. There are two instrument ports in the aircraft. The RSL 1268 Multispectral Scanner was mounted over the aft port and the NASA Thermal Infrared Multispectral Scanner was mounted over the forward port.

RSL Daedalus 1268 MSS

The DOE Multispectral Scanner simulates the spectral characteristics the Thematic Mapper (TM) multispectral scanners orbiting on Landsat 4 and Landsat 5. The seven TM bands are replicated with the MSS and four additional bands of discrete wavelengths are acquired. THE MSS acquires TM band six (thermal data) as two bands in low and high gain settings. The scanner is configured as follows:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, mm</u>
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.75 - 0.90

8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 12.5 low gain
12	6	8.5 - 12.5 high gain

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Total Scan Angle:	86°
Pixels/Scan Line:	716
Scan Rate:	12.5/25/50/100 scans/second

Thermal Infrared Multispectral Scanner

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 *mm* to 12.2 *mm* region.

<u>Channel</u>	<u>Wavelength, <i>mm</i></u>	<u>NET</u>
1	8.2 - 8.6	< 0.3° C
2	8.6 - 9.0	< 0.3° C
3	9.0 - 9.4	< 0.3° C
4	9.4 - 10.2	< 0.3° C
5	10.2 - 11.2	< 0.3° C
6	11.2 - 12.2	< 0.3° C

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meters) at 65,000 feet
Total Scan Angle:	76.56°
Swath Width:	16.9 nmi (31.3 km) at 65,000 feet
Pixels/Scan Line:	638
Scan Rate:	7.3 (scans/second)
Ground Speed:	400 kts. (206 m/second)

Information on data tape format, logical record format, and scanner calibration data may be obtained from the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 650-604-6252).

TIMS FLIGHT DATA
FLIGHT NUMBER: 97-007-04

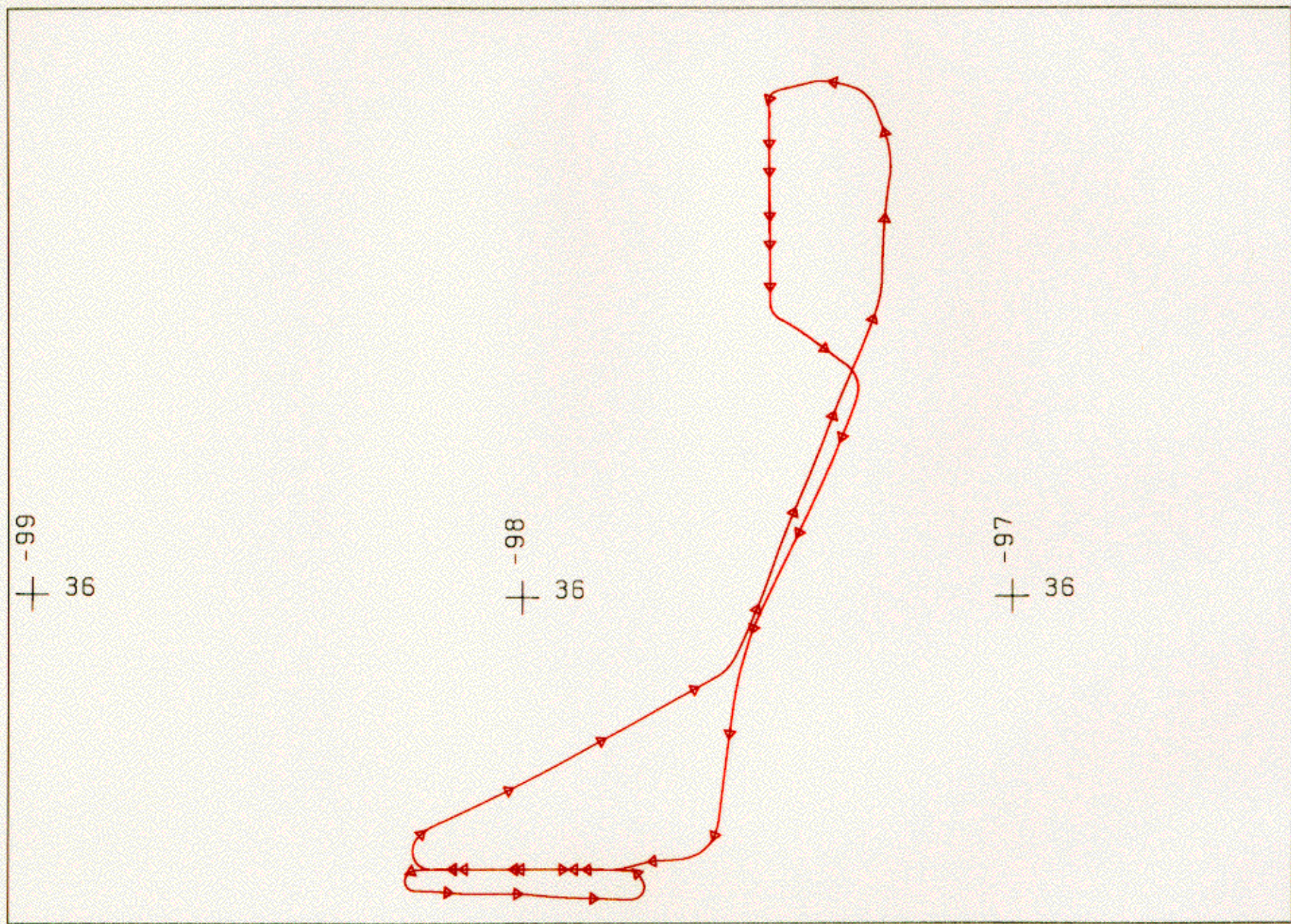
Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d		A c t u a l scanline begin e n d		Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines
1.	746	1	1	12:02:32.0 12:06:54.2	55438 61994	16000/ 4877	25.00	6557	0	0	
2.	748	1	1	12:22:18.9 12:26:56.9	85111 92061	16000/ 4877	25.00	6951	0	0	
3.	748	1	2	16:01:31.0 16:06:39.1	30326 38029	5000/ 1524	25.00	7698	0	6	
4.	748	1	3	16:17:00.6 16:21:51.0	53566 60825	16000/ 4877	25.00	7260	0	0	
5.	746	1	2	16:45:38.5 16:50:22.2	96514 103605	16000/ 4877	25.00	7092	0	0	

Notes: Site 746 CART ARM Oklahoma
Site 748 El Reno Oklahoma

DoE DAEDALUS TMS FLIGHT DATA
FLIGHT NUMBER: 97-007-04

Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d		A c t u a l scanline begin e n d		Altitude feet/meter		Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines
1.	746	1	1	12:02:32.0 12:06:55.1	27894 31183	16000/ 4877	12.50	3290	0	0		
2.	748	1	1	12:22:24.8 12:26:56.4	42804 46199	16000/ 4877	12.50	3396	0	0		
3.	748	1	2	16:01:31.0 16:06:40.3	29484 37216	5000/ 1524	25.00	7733	0	0		
4.	748	1	3	16:16:35.0 16:22:01.6	45595 49677	16000/ 4877	12.50	4083	0	0		
5.	746	1	2	16:45:38.4 16:50:31.4	67387 71050	16000/ 4877	12.50	3664	0	0		

Notes: Site 746 CART ARM Oklahoma
Site 748 El Reno Oklahoma

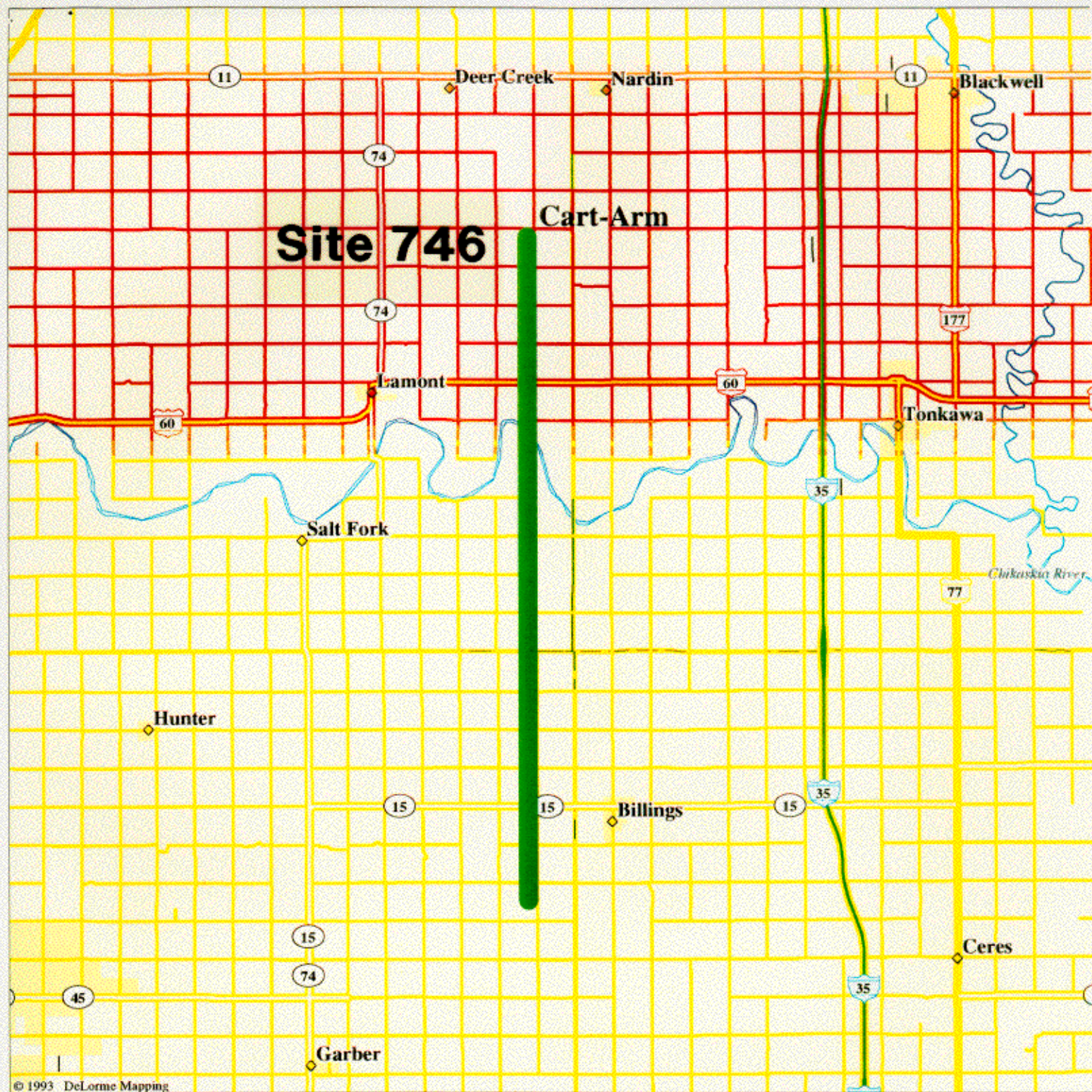


FLIGHT 97-007-04

2 JULY 1997

A/C 799

TIMS / TMS



LEGEND

- State Route
- Town, Small City
- Interstate, Turnpike
- US Highway
- County Boundary
- Population Center
- Major Street/Road
- Interstate Highway
- State Route

- US Highway
- River
- Airfield
- Open Water

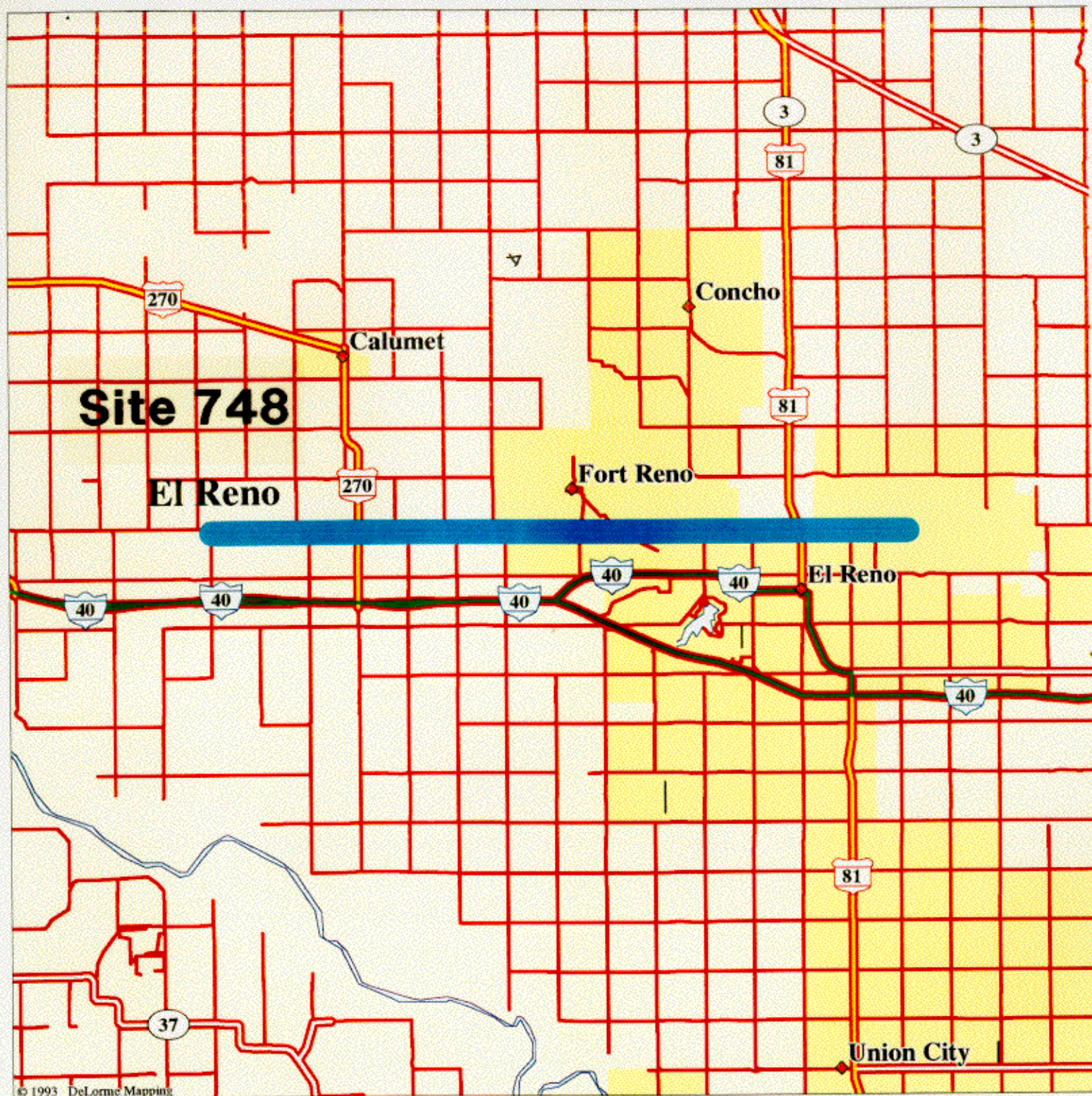
Scale 1:225,000 (at center)

5 Miles


5 KM





Mag 11.00

Fri Jun 27 15:38:57 1997



LEGEND

-  State Route
-  Town, Small City
-  Interstate, Turnpike
-  US Highway
-  County Boundary
-  Population Center
-  Major Street/Road
-  Interstate Highway
-  State Route

-  US Highway
-  River
-  Airfield
-  Open Water

Scale 1:175,000 (at center)

2 Miles

5 KM

Mag 11.00

Fri Jun 27 15:47:26 1997